

WHAT IS CLAIMED IS:

1. An apparatus for providing a driving signal to an organic light emitting diode
in an image display device, comprising:

first and second control lines for transferring previous and current control signals,

5 respectively, in a sequential process for providing the driving signal to the organic light
emitting diode;

a data line for transferring a data signal for displaying images on the image
display device;

a first switching device including a conduction path for transferring the data
10 signal from the data line, the conduction path of the first switching device being
controlled by the current control signal from the second control line;

a second switching device including a conduction path for transferring a reference
signal externally supplied, the conduction path of the second switching device being
controlled by the previous control signal from the first control line;

15 a third switching device including a conduction path for transferring the data
signal provided from the first switching device, the conduction path of the third switching
device being controlled by a state of the second switching device; and

a fourth switching device including a conduction path for receiving a bias voltage and generating the driving signal to the organic light emitting diode, the conduction path of the fourth switching device being controlled by one of the reference signal from the second switching device and the data signal from the third switching device.

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2. The apparatus of claim 1, wherein the third and fourth switching devices have switching characteristics substantially identical to each other.

3. The apparatus of claim 2, further including a capacitor for being charged
10 with the bias voltage and for providing a voltage signal to control the conduction path of the third switching device.

4. The apparatus of claim 3, wherein the first, second, third and fourth
switching devices are first, second, third and fourth thin film transistors, respectively,
15 each having a conduction path between a source and a drain and a gate for receiving a control signal to control the conduction path; the first and second control signal lines are first and second gate lines, respectively; and the previous and current control signals are previous and current gate signals, respectively.

5. The apparatus of claim 4, wherein the first, second, third and fourth thin film transistors are polysilicon thin film transistors.

5 6. The apparatus of claim 4, wherein the first thin film transistor has a gate to which the current gate signal is applied from the second gate line and a source and a drain to form the conduction path for transferring the data signal; the second thin film transistor has a gate to which the previous gate signal is applied from the first gate line and a source and a drain to form the conduction path for transferring the reference signal; the third thin
10 film transistor has a gate to which the voltage signal from the capacitor is applied and a source and a drain to form the conduction path for transferring the data signal; and the fourth thin film transistor has a gate to which one of the reference signal from the second thin film transistor and the data signal from the third thin film transistor is applied and a source and a drain to form the conduction path between the bias voltage and the organic
15 light emitting diode.

7. The apparatus of claim 6, wherein the conduction path of the second thin film transistor and the conduction path of the third thin film transistor are connected to

the gate of the fourth thin film transistor and are parallel to each other with respect to the gate of the fourth thin film transistor.

8. The apparatus of claim 6, wherein the gate of the third thin film transistor is
5 connected with the gate of the fourth thin film transistor.

9. The apparatus of claim 6, wherein the third and fourth thin film transistors
have a substantially identical threshold voltage.

10 10. The apparatus of claim 9, wherein the threshold voltage of the third and
fourth thin film transistors has a negative value.

11. The apparatus of claim 6, wherein the first and second thin film transistors are
N-type thin film transistors, and the third and fourth thin film transistors are P-type thin
15 film transistors.

12. The apparatus of claim 11, wherein the reference voltage is equal to or larger
than a gate-off voltage of the first thin film transistor and is equal to or less than a sum of

a threshold voltage of the third thin film transistor and a minimum voltage value of the data signal.

13. The apparatus of claim 6, wherein an effective gate-source voltage of the
5 fourth thin film transistor is dependent on the bias voltage and the data signal and independent of a threshold voltage of the fourth thin film transistor.

14. The apparatus of claim 6, wherein the bias voltage is provided from a power
supply line disposed substantially parallel with the data line.
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15. The apparatus of claim 6, further including a fifth thin film transistor having a
conduction path between the fourth thin film transistor and the organic light emitting
diode, the conduction path being controlled by the previous gate signal from the first gate
line.
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16. The apparatus of claim 15, wherein the fifth thin film transistor is a P-type
thin film transistor having a source and a drain forming the conduction path and a gate
receiving the previous gate signal.

17. The apparatus of claim 6, wherein the source of the second thin film transistor is connected with the second gate line, so that the conduction path of the second thin film transistor transfers the current gate signal to the fourth thin film transistor as the
5 reference signal.

18. The apparatus of claim 6, wherein the bias voltage is provided from a power supply line disposed substantially parallel with the first and second gate lines.

10 19. The apparatus of claim 18, further including a fifth thin film transistor having a conduction path between the fourth thin film transistor and the organic light emitting diode, the conduction path being controlled by the current gate signal from the second gate line.

15 20. The apparatus of claim 19, wherein the fifth thin film transistor is a P-type thin film transistor having a source and a drain forming the conduction path and a gate receiving the current gate signal.

21. The apparatus of claim 18, further including:

a fifth thin film transistor having a conduction path for transferring the driving signal from the fourth thin film transistor, the conduction path being controlled by the previous gate signal from the first gate line; and

5 a sixth thin film transistor having a conduction path for transferring the driving signal from the fifth thin film transistor to the organic light emitting diode, the conduction path of the sixth thin film transistor being controlled by the current gate signal from the second gate line.

10 22. The apparatus of claim 21, wherein the fifth thin film transistor is a P-type thin film transistor having a source and a drain forming the conduction path for transferring the driving signal from the fourth thin film transistor and a gate receiving the previous gate signal, and the sixth thin film transistor is an N-type thin film transistor having a source and a drain forming the conduction path for transferring the driving
15 signal from the fifth thin film transistor and a gate receiving the current gate signal.

23. The apparatus of claim 6, wherein the first, second, third and fourth thin film transistors are P-type thin film transistors, and the fifth thin film transistor is an N-type thin film transistor.

5 24. The apparatus of claim 23, wherein the reference voltage is larger than a gate-off voltage of the first thin film transistor.

25. The apparatus of claim 24, wherein the reference voltage is smaller than a sum of a threshold voltage of the third thin film transistor and a minimum voltage value
10 of the data signal.

26. An organic light emitting display device comprising:

a plurality gate lines to which an active gate line is sequentially supplied;

a plurality of data lines to which data signals are applied to display images on the
15 organic light emitting display device; and

a plurality of pixel driving units each of which provides a driving signal to a

corresponding OLE diode in association with a pair of the gate lines and a pair of the data

lines, wherein each of the pixel driving units includes:

a driving transistor having a conduction path with one terminal receiving a
bias voltage and the other terminal providing the driving signal to the diode;
a first switching transistor having a conduction path for transferring a
reference signal, the conduction path of the first switching transistor being
5 controlled by a previous gate signal; and
a second switching transistor having a conduction path for transferring a
data signal, the conduction path of the second switching transistor being
controlled by a state of the first switching transistor,
wherein the conduction path of the driving transistor is controlled by one
10 of the reference signal from the first switching transistor and the data signal from
second switching transistor.

27. The organic light emitting display device of claim 26, wherein a plurality of
gate lines including a dummy gate line for providing a gate signal to the first switching
15 transistor of a first one of the pixel driving units.

28. The organic light emitting display device of claim 27, wherein the dummy
gate line is synchronized with a last one of the gate lines.

29. The organic light emitting display device of claim 27, wherein a same gate signal is applied to the dummy gate line and a last one of the gate lines simultaneously.

5 30. The organic light emitting display device of claim 26, wherein each of the pixel driving units further includes a third switching transistor having a conduction path for transferring the data signal from a corresponding one of the data lines to the second switching transistor, the conduction path of the third switching transistor being controlled by the current gate signal.

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31. The organic light emitting display device of claim 26, wherein the driving transistor and the second switching transistor have a substantially identical threshold voltage.

15 32. The organic light emitting display device of claim 26, further including a plurality of power supply lines each of which is associated with a corresponding one of the pixel driving units for providing the bias voltage to the corresponding pixel driving unit, wherein the power supply lines are parallel with the data lines.

33. The organic light emitting display device of claim 26, further including a plurality of power supply lines each of which is associated with a corresponding one of the pixel driving units for providing the bias voltage to the corresponding pixel driving unit, wherein the power supply lines are parallel with the gate lines.

34. The organic light emitting display device of claim 26, wherein the driving, first and second switching transistors are thin film transistors each having a source and a drain forming a conduction path and a gate receiving a gate signal to control the conduction path.

35. A method for fabricating a semiconductor device for providing a pixel driving signal in an organic light emitting display device, comprising:
providing an insulation substrate;
forming on the insulation substrate a first amorphous silicon thin film transistor for providing the pixel driving signal to an organic light emitting diode;

forming on the insulation substrate a second amorphous silicon thin film transistor for transferring a data signal to control a switching function of the first amorphous silicon thin film transistor;

- crystallizing the first and second amorphous silicon thin film transistors by
- 5 performing a laser scan on the first and second amorphous silicon thin film transistor; and

transforming the first and second amorphous silicon thin film transistor into first and second polysilicon thin film transistors, respectively, by consummating the crystallizing step,

- wherein the first and second polysilicon thin film transistors have characteristics
- 10 substantially identical to each other.

36. The method of claim 35, wherein the forming the first amorphous silicon thin film transistor includes forming a gate electrode of the first amorphous silicon thin film transistor in a direction substantially parallel to a laser scan direction, and the forming the
- 15 second amorphous silicon thin film transistor includes forming a gate electrode of the second amorphous silicon thin film transistor in the direction substantially parallel to the laser scan direction.

37. The method of claim 36, wherein the forming the first amorphous silicon thin film transistor includes forming source and drain electrodes of the first amorphous silicon thin film transistor in a collinear direction substantially perpendicular to the laser scan direction, and the second amorphous silicon thin film transistor includes forming source
5 and drain electrodes of the second amorphous silicon thin film transistor in the collinear direction substantially perpendicular to the laser scan direction.

38. The method of claim 35, wherein the forming the first amorphous silicon thin film transistor includes forming a gate electrode of the first amorphous silicon thin film
10 transistor in a collinear direction substantially perpendicular to a laser scan direction, and the forming the second amorphous silicon thin film transistor includes forming a gate electrode of the second amorphous silicon thin film transistor in the collinear direction substantially perpendicular to the laser scan direction.

15 39. The method of claim 38, wherein the forming the first amorphous silicon thin film transistor includes forming source and drain electrodes of the first amorphous silicon thin film transistor in a direction substantially parallel to the laser scan direction, and the second amorphous silicon thin film transistor includes forming source and drain

electrodes of the second amorphous silicon thin film transistor in the direction
substantially parallel to the laser scan direction.

40. The method of claim 35, further including forming a mask that forms a laser
5 beam pattern on the insulation substrate.

41. The method of claim 40, further including exposing a pattern of the mask to
the insulation substrate by zooming-out the pattern.

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